JC17 Rec'd PCT/PTO 12 JUL 2001

°FORM PTO-1390 (REV 11-2000) U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. § 371

ATTORNEY'S DOCKET NUMBER	U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
449122008200	09/889179 Not yet assigned

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE00/00063	10 January 2000	13 January 1999

TITLE OF INVENTION
METHOD FOR SWITCHING A COMMUNICATIONS LINK TO ANOTHER CHANNEL (HANDOVER)

APPLICANT(S) FOR DO/EO/US
Juergen SCHINDLER *et al.*

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau).
   b. ☒ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application under PCT Article 19 (35 U.S.C. 371(c)(2)).
   a. ☒ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S C. 371(c)(3)).
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3))
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information: 1. Application Data Sheet 2. IPER 3. Intl Search Report 4. Return receipt postcard.

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on July 12, 2001.

R. Lynn Boyden

R. Lynn Boyden

dc-270991

JC13 Rec'd PCT/PTO 12 JUL 2001

U.S. APPLICATION NO (if known, see 37 CFR 1.5) Not yet assigned 09/889179	INTERNATIONAL APPLICATION NO. PCT/DE00/00063	ATTORNEY'S DOCKET NUMBER: 449122008200

21. ☒ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.....$1,000.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....$860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provision of PCT Article 33(1)-(4) $690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00

	CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$0	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	13 - 20 =	0	x $18.00	$0	
Independent claims	3 - 3 =	0	x $80.00	$0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $270.00	$0	
			TOTAL OF ABOVE CALCULATIONS =	$860.00	
Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½.				$0	
			SUBTOTAL =	$860.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).			+	$0	
			TOTAL NATIONAL FEE =	$860.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00 per property**			+	$40.00	
			TOTAL FEES ENCLOSED =	$900.00	
			Amount to be refunded:		**$**
			charged:		**$**

a. ☒ Please charge my **Deposit Account No. 03-1952** in the amount of $900.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

b. ☒ The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to **Deposit Account No. 03-1952**. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Kevin R. Spivak
Morrison & Foerster LLP
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006-1888

SIGNATURE

Kevin R. Spivak
Registration No. 43,148

09/889179
JC18 Rec'd PCT/PTO 12 JUL 2001

PATENT
Docket No. 449122008200

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on July 12, 2001.

R Lynn Boyden

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Juergen SCHINDLER *et al.*

Serial No.: Not yet Assigned

Filing Date: July 12, 2001

For: METHOD FOR SWITCHING A COMMUNICATIONS LINK TO ANOTHER CHANNEL (HANDOVER)

Examiner: Not yet Assigned

Group Art Unit: Not yet Assigned

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination on the merits, please amend this application as follows:

In the Specification:

On page 1 before the first paragraph, please insert the following headings and paragraphs:

CLAIM FOR PRIORITY

This application claims priority to International Application No. PCT/DE00/00063 which was published in the German language on July 20, 2000.

09/889179
JC18 Rec'd PCT/PTO 12 JUL 2001

TECHNICAL FIELD OF THE INVENTION

The invention relates to a method for switching a communications link to another channel (handover), and in particular, to a method in digital cellular mobile radio systems and a mobile radio system.

On page 1, between lines 17 and 18 please insert the following heading:

BACKGROUND OF THE INVENTION

Please replace the paragraph beginning on page 3, line 24, with the following rewritten paragraph:

The cellular structure of the entire coverage area demands that a seamless handover of a mobile station from the previous coverage area to another coverage area is established if the latter promises better transmission quality. The handover is a very critical process with respect to timing since the continuity of current calls must be ensured. It has a significant influence on the capacity and the performance of cellular networks and includes the following three phases: measurement, handover initiation, switchover to the destination base station. The continuous measurements have the purpose of detecting whether a handover is necessary. A handover algorithm makes the decision whether and when a change of transmission channel is required or appropriate dependent on various criteria such as received power, bit error rates, signal/noise ratios and distance from the current base station.

On page 4, between lines 33 and 34, please insert the following headings and paragraphs:

SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a method for switching a communications link to another channel (handover) within or between mobile radio systems. The method includes splitting data to be transmitted into frames of identical length and interleaved; and

determining a time of handover using a decision algorithm, wherein the handover occurs after a complete frame has been transmitted.

In one aspect of the invention, the handover is carried out at least partially based on the interleaving depth.

In another aspect of the invention, the time of handover is determined by a network on the basis of the knowledge of the interleaving of the transmitted data.

In yet another aspect of the invention, the time of handover is determined by a mobile station on the basis of the knowledge of the interleaving of the transmitted data.

In still another aspect of the invention, during data transmissions in TDMA systems, handover occurs after transmission of a TDMA frame with a TDMA frame number wherein (TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

BRIEF DESCRIPTION OF THE INVENTION

The invention and its advantages will be explained in greater detail with reference to an exemplary embodiment, associated with the drawings, in which:

Figure 1 shows a reference model of voice transmission in digital mobile radio.

Figure 2 shows a section according to the reference model of figure 1, including exemplary values of a transmission during a handover in accordance with the prior art.

Figure 3 shows a section according to the reference model of figure 1 with exemplary values of a transmission in the case of a handover according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention relates to a method for switching a communications link to another channel (handover), and in particular, to a method in digital cellular mobile radio systems and a mobile radio system, the time of the handover being determined by a decision algorithm. The changeover to a new channel can take place between two radio systems or frequency bands within a radio system (external handover), between two radio cells within a cellular network

(intercell handover) or within a radio cell (intracell handover). Each handover case, in turn, can include various type of handover.

Please replace the paragraph beginning on page 4, line 35, with the following rewritten paragraph:

In one embodiment of the invention, the disturbances described above are reduced, increased by the interleaving of the data, during handover.

On page 1, please delete lines 1-5.

Please replace the paragraph beginning on page 5, line 7, with the following rewritten paragraph:

A handover according to the invention is performed after the transmission of a complete voice or data frame, taking into consideration the interleaving depth, as a result of which the data losses in the currently used handover methods as described above are reliably prevented. Handover is understood to be not only the intracell handover or the handover between two cells of a cellular network but also the handover from one system to another system such as, for example, from UMTS TDD to UMTS FDD or to GSM or internally in the case of a handover from one frequency to another frequency.

Please replace the paragraph beginning on page 5, line 20, with the following rewritten paragraph:

The time of the handover is determined by a device which is implemented in the network and/or in the mobile station. It is additionally determined on the basis of the knowledge of the interleaving of the transmission data.

Please replace the paragraph beginning on page 5, line 26, with the following rewritten paragraphs:

In the case of data transmissions (voice, fax, modem) in TDMA systems, handover takes place after transmission of a TDMA frame having a TDMA frame number that meets the condition:

(TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

Please replace the paragraph beginning on page 5, line 33, with the following rewritten paragraph:

In the case of voice links, this means that the first block of the voice frame is transmitted in an odd-numbered TDMA frame and the second block of the voice frame is transmitted in an even-numbered TDMA frame and the handover is thus performed after an even-numbered TDMA frame has been transmitted.

Please replace the paragraph beginning on page 6, line 22, with the following rewritten paragraph:

In an analogous application, the method can also be applied to the transmission of packet data by performing a handover when a packet data unit (PDU) or a self-contained packet has been completely transmitted.

On page 6, please delete lines 28-30.

On page 6, please delete lines 32-33.

On page 6, please delete lines 35-38.

On page 7, please delete lines 1-4.

Please replace the paragraph beginning on page 7, line 6, with the following rewritten paragraph:

The diagrammatic reference model for voice transmission in a digital mobile radio network, shown in figure 1, shows individual processing from the voice input to the reproduction. Initially, voice 1 is digitized at 2, channel coding takes place at 3, interleaving takes place at 4, burst formatting takes place at 5, encryption takes place at 6 and at 7 the binary data are modulated onto the carrier signal. After the data have been transmitted to a receiver via a radio interface, demodulation takes place at 8, the data are decrypted at 9, the burst information from 5 is analyzed at 10, the interleaved data are sorted into the correct output order at 11, channel decoding takes place at 12 and, finally, at 13 the digital signals are converted into the transmitted voice information 14.

Please replace the paragraph beginning on page 7, line 22, with the following rewritten paragraph:

Figure 2 shows, by way of example, a voice frame 15 as provided after the channel coding at 3. The voice frame 15 is split into two TDMA frames 17 by an interleaving matrix 16 which is formed by writing the voice frame 15 in row by row, in such a manner that any bit errors are distributed, thus increasing the possibility of error repair. Assuming handover takes place after the first TDMA frame has been transmitted from 17 so that the second TDMA frame is missing, data losses are produced during the reconstruction of the interleaving matrix at the receiver end 18 from the point at which handover took place and these data losses cannot be repaired in the received data frame 19. This data frame is thus unusable and the information contained in it is lost. Naturally, this also applies to the case where the second TDMA frame is transmitted.

Please replace the paragraph beginning on page 7a, line 1, with the following rewritten paragraph:

According to figure 3, handover always takes place after the entire voice frame has been transmitted, thus after both TDMA frames 17 have been transmitted, in the example, so that the data losses shown in figure 2 can no longer occur and the received voice frame 18 includes the data in full. Since voice frames always have a particular length and thus there is a net data rate of 160 bits, for example, in the case of 8-kbit/s voice and a period of 20 ms, the end of a voice frame can be easily counted off.

On page 9, line 1, please replace "Patent Claims" with --WHAT IS CLAIMED IS--.

In the Claims:

1. (Amended) A method for switching a communications link to another channel (handover) within or between mobile radio systems, comprising:

splitting data to be transmitted into frames of identical length and interleaved; and

determining a time of handover using a decision algorithm, wherein the handover occurs after a complete frame has been transmitted.

2. (Amended) The method as claimed in claim 1, wherein the handover is carried out at least partially based on the interleaving depth.

3. (Amended) The method as claimed in claim 1, wherein the time of handover is determined by a network on the basis of the knowledge of the interleaving of the transmitted data.

4. (Amended) The method as claimed in claim 1, wherein the time of handover is determined by a mobile station on the basis of the knowledge of the interleaving of the transmitted data.

5. (Amended) The method as claimed in claim 1, wherein during data transmissions in TDMA systems, handover occurs after transmission of a TDMA frame with a TDMA frame number wherein

(TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

6. (Amended) The method as claimed in claim 1, wherein in the case of voice links, a first data block of a voice frame is transmitted in an odd-numbered TDMA frame and the second data block of a voice frame is transmitted in an even-numbered TDMA frame and the handover is performed after an even-numbered TDMA frame has been transmitted.

7. (Amended) The method as claimed in claim 1, wherein in the case of a transmission of a voice or data frame over n time slots, a first block of the voice frame is transmitted in an even-numbered TDMA frame and a second block of the voice or data frame is transmitted in an odd-numbered TDMA frame and the handover is performed after an odd-numbered TDMA frame has been transmitted.

8. (Amended) The method as claimed in claim 2, wherein a flag marks the interleaving depth to be considered in the handover.

9. (Amended) The method as claimed in claim 8, wherein a flag specifying the interleaving depth to be considered is set for respective voice and data services.

10. (Amended) The method as claimed in claim 1, wherein in the case of transmitted data in CDMA systems, the handover occurs after a complete frame has been transmitted.

11. (Amended) A method for switching a communications link to another channel (handover) within or between mobile radio systems with packet access, comprising: determining a time of handover using a decision algorithm, wherein the handover occurs after a complete segment or a self-contained packet has been transmitted.

12. (Amended) A digital cellular mobile radio system having a network and mobile stations, comprising: a device to switching a communications link to another channel (handover) which uses a decision algorithm with respect to a time of handover, the handover occurring after a complete voice or data frame has been transmitted.

Please add the following claim:

13. The method as claimed in claim 1, wherein the frames are voice or data frames.

In the Abstract:

Please replace the Abstract in its entirety with the Abstract attached hereto.

REMARKS

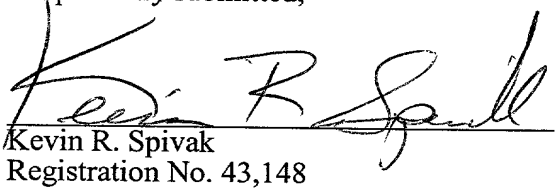
The above amendments to the specification, claims and abstract have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 449122008200. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: July 12, 2001

By: 

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DC270936.DOC

VERSION WITH MARKINGS TO SHOW CHANGES MADE

For the convenience of the Examiner, the changes made are shown below with deleted text in strikethrough and added text in underline.

In the Specification:

Page 1 between lines 4 and 5 has been amended to include the following insert:

CLAIM FOR PRIORITY

This application claims priority to International Application No. PCT/DE00/00063 which was published in the German language on July 20, 2000.

TECHNICAL FIELD OF THE INVENTION

Paragraph beginning on line 6 of page 1 has been amended as follows:

The invention relates to a method for switching a communications link to another channel (handover), and in particular, to a method in digital cellular mobile radio systems and a mobile radio system.~~, the time of the handover being determined by a decision algorithm. Roughly generalized, the changeover to a new channel can take place between two radio systems or frequency bands within a radio system (external handover), between two radio cells within a cellular network (intercell handover) or within a radio cell (intracell handover). Each handover case, in turn, can include various type of handover.~~

Page 1 between lines 17 and 18 has been amended to include the following insert:

BACKGROUND OF THE INVENTION

Paragraph beginning on line 24 of page 3 has been amended as follows:

The cellular structure of the entire coverage area demands that a seamless handover of a mobile station from the previous coverage area to another coverage area is established if the latter promises better transmission quality. The handover is a very critical process with respect to timing since the continuity of current calls must be ensured. It has a significant influence on the capacity and the performance of cellular networks and ~~consists of~~ includes the following three phases: measurement, handover initiation, switchover to the destination base station. The continuous measurements have the purpose of detecting whether a handover is necessary. A handover algorithm makes the decision whether and when a change of transmission channel is required or appropriate dependent on various criteria such as received power, bit error rates, signal/noise ratios and distance from the current base station.

Page 4 between lines 33 and 34 has been amended to include the following insert:

SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a method for switching a communications link to another channel (handover) within or between mobile radio systems. The method includes splitting data to be transmitted into frames of identical length and interleaved; and determining a time of handover using a decision algorithm, wherein the handover occurs after a complete frame has been transmitted.

In one aspect of the invention, the handover is carried out at least partially based on the interleaving depth.

In another aspect of the invention, the time of handover is determined by a network on the basis of the knowledge of the interleaving of the transmitted data.

In yet another aspect of the invention, the time of handover is determined by a mobile station on the basis of the knowledge of the interleaving of the transmitted data.

In still another aspect of the invention, during data transmissions in TDMA systems, handover occurs after transmission of a TDMA frame with a TDMA frame number wherein (TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

BRIEF DESCRIPTION OF THE INVENTION

The invention and its advantages will be explained in greater detail with reference to an exemplary embodiment, associated with the drawings, in which:

Figure 1 shows a reference model of voice transmission in digital mobile radio.

Figure 2 shows a section according to the reference model of figure 1, including exemplary values of a transmission during a handover in accordance with the prior art.

Figure 3 shows a section according to the reference model of figure 1 with exemplary values of a transmission in the case of a handover according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention relates to a method for switching a communications link to another channel (handover), and in particular, to a method in digital cellular mobile radio systems and a mobile radio system, the time of the handover being determined by a decision algorithm. The changeover to a new channel can take place between two radio systems or frequency bands within a radio system (external handover), between two radio cells within a cellular network (intercell handover) or within a radio cell (intracell handover). Each handover case, in turn, can include various type of handover.

Paragraph beginning on line 35 of page 4 has been amended as follows:

~~The invention is based on the object of reducing~~ In one embodiment of the invention, the disturbances described above are reduced, increased by the interleaving of the data, during handover.

Paragraph beginning on line 1 of page 5 has been amended as follows:

~~The object is achieved by methods having the feature of the independent claims 1 and 11 and by a mobile radio system having the features of claim 12. Advantageous further developments of the invention are specified in the dependent claims 2 to 10.~~

Paragraph beginning on line 7 of page 5 has been amended as follows:

~~According to this, a~~ A handover according to the invention is ~~only~~ performed after the transmission of a complete voice or data frame, taking into consideration the interleaving depth, as a result of which the data losses in the currently used handover methods as described above are reliably prevented. Handover is understood to be not only the intracell handover or the handover between two cells of a cellular network but also the handover from one system to another system such as, for example, from UMTS TDD to UMTS FDD or to GSM or internally in the case of a handover from one frequency to another frequency.

Paragraph beginning on line 20 of page 5 has been amended as follows:

The time of the handover is ~~lastly~~ determined by a device which is implemented in the network and/or in the mobile station. It is additionally determined on the basis of the knowledge of the interleaving of the transmission data.

Paragraph beginning on line 26 of page 5 has been amended as follows:

In the case of data transmissions (voice, fax, modem) in TDMA systems, handover ~~only~~ takes place after transmission of a TDMA frame having a TDMA frame number that meets the condition:

(TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

Paragraph beginning on line 33 of page 5 has been amended as follows:

In the case of voice links, this means that the first block of the voice frame is transmitted in an odd-numbered TDMA frame and the second block of the voice frame is transmitted in an even-numbered TDMA frame and the handover is thus performed ~~exclusively~~ after an even-numbered TDMA frame has been transmitted.

Paragraph beginning on line 22 of page 6 has been amended as follows:

In an analogous application, the method can also be applied to the transmission of packet data by performing a handover ~~only~~ when a packet data unit (PDU) or a self-contained packet has been completely transmitted.

Paragraph beginning on line 28 of page 6 has been amended as follows:

~~The invention and its advantages will be explained in greater detail with reference to an exemplary embodiment, associated with a drawing, in which:~~

Paragraph beginning on line 32 of page 6 has been amended as follows:

~~Figure 1 shows a reference model of voice transmission in digital mobile radio,~~

Paragraph beginning on line 35 of page 6 has been amended as follows:

~~Figure 2 shows a section according to the reference model of figure 1, containing exemplary values of a transmission during a handover in accordance with the prior art, and~~

Paragraph beginning on line 1 of page 7 has been amended as follows:

~~Figure 3 shows a section according to the reference model of figure 1 with exemplary values of a transmission in the case of a handover according to the invention.~~

Paragraph beginning on line 6 of page 7 has been amended as follows:

The diagrammatic reference model for voice transmission in a digital mobile radio network, shown in figure 1, shows ~~the~~ individual processing ~~steps~~ from the voice input to the reproduction. Initially, voice 1 is digitized at 2, channel coding takes place at 3, interleaving takes place at 4, burst formatting takes place at 5, encryption takes place at 6 and at 7 the binary data are modulated onto the carrier signal. After the data have been transmitted to a receiver via a radio interface, demodulation takes place at 8, the data are decrypted at 9, the burst information from 5 is analyzed at 10, the interleaved data are sorted into the correct output order at 11, channel decoding takes place at 12 and, finally, at 13 the digital signals are converted into the transmitted voice information 14.

Paragraph beginning on line 22 of page 7 has been amended as follows:

Figure 2 shows, by way of example, a voice frame 15 as provided after the channel coding at 3. The voice frame 15 is split into two TDMA frames 17 by ~~means of~~ an interleaving matrix 16 which is formed by writing the voice frame 15 in row by row, in such a manner that any bit errors are distributed, thus increasing the possibility of error repair. Assuming handover takes place after the first TDMA frame has been transmitted from 17 so that the second TDMA frame is missing, data losses are produced during the reconstruction of the interleaving matrix at the receiver end 18 from the point at which handover took place and these data losses cannot be repaired in the received data frame 19. This data frame is thus unusable and the information contained in it is lost. Naturally, this also applies to the case where ~~only~~ the second TDMA frame is transmitted.

Paragraph beginning on line 1 of page 7a has been amended as follows:

According to figure 3, handover always takes place after the entire voice frame has been transmitted, thus after both TDMA frames 17 have been transmitted, in the example, so that the data losses shown in figure 2 can no longer occur and the received voice frame 18 <u>includes</u> ~~contains~~ the data in full. Since voice frames always have a particular length and thus there is

~~always~~ a net data rate of 160 bits, for example, in the case of 8-kbit/s voice and a period of 20 ms, the end of a voice frame can be easily counted off.

On page 9, line 1, please replace "Patent Claims" with --WHAT IS CLAIMED IS--.

In the Claims:

1. A method for switching a communications link to another channel (handover) within or between ~~digital cellular~~ mobile radio systems, comprising:

splitting ~~consisting of a network and mobile stations in which the~~ data to be transmitted ~~are split~~ into ~~so-called voice or data~~ frames of identical length and ~~are~~ interleaved; and ~~where the~~

determining a time of handover ~~is determined by~~ using a decision algorithm, ~~characterized in that~~ wherein the handover ~~only takes place~~ occurs after a complete ~~voice or data~~ frame has been transmitted.

2. (Amended) The method as claimed in claim 1, wherein ~~characterized in that~~ the handover is carried out at least partially based on ~~taking into consideration~~ the interleaving depth.

3. (Amended) The method as claimed in claim 1, ~~characterized in that~~ wherein the time of handover is determined by a ~~the~~ network on the basis of the knowledge of the interleaving of the transmitted ~~transmission~~ data.

4. (Amended) The method as claimed in claim 1, ~~characterized in that~~ wherein the time of handover is determined by a ~~the~~ mobile station on the basis of the knowledge of the interleaving of the transmitted ~~transmission~~ data.

5. (Amended) The method as claimed in claim 1, ~~characterized in that in the case of~~ wherein during data transmissions ~~(voice, fax, modem, multimedia)~~ in TDMA systems, handover occurs ~~only takes place~~ after transmission of a TDMA frame with a TDMA frame number wherein ~~that meets the condition:~~

(TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

6. (Amended) The method as claimed in claim 1, ~~characterized in that~~ wherein in the case of voice links, a ~~the~~ first data block of ~~the~~ a voice frame is transmitted in an odd-numbered TDMA frame and the second data block of ~~the~~ a voice frame is transmitted in an even-numbered TDMA frame and the handover is ~~thus~~ performed ~~exclusively~~ after an even-numbered TDMA frame has been transmitted.

7. (Amended) The method as claimed in claim 1, ~~characterized in that~~ wherein in the case of a transmission of a voice or data frame over n ~~(n = integral, even-numbered)~~ time slots, ~~the~~ a first block of the voice frame is transmitted in an even-numbered TDMA frame and a ~~the~~ second block of the voice or data frame is transmitted in an odd-numbered TDMA frame and the handover is ~~thus~~ performed ~~exclusively~~ after an odd-numbered TDMA frame has been transmitted.

8. (Amended) The method as claimed in claim 2, ~~characterized in that~~ wherein a flag marks the interleaving depth to be considered ~~taken into consideration~~ in the handover.

9. (Amended) The method as claimed in claim 8, ~~characterized in that~~ wherein a flag specifying the interleaving depth to be ~~taken into consideration~~ considered is set for respective voice and data ~~each~~ services ~~(voice service, data service)~~.

10. (Amended) The method as claimed in claim 1, ~~characterized in that~~ wherein in the case of transmitted data ~~transmissions~~ in CDMA systems, the handover ~~only takes place~~ occurs after a complete ~~voice or data~~ frame has been transmitted.

11. (Amended) A method for switching a communications link to another channel (handover) within or between ~~digital cellular~~ mobile radio systems with packet access, comprising: ~~consisting of a network and mobile stations, the~~ determining a time of handover ~~being determined by~~ using a decision algorithm, wherein ~~characterized in that~~ the handover ~~only takes place~~ occurs after a complete segment ~~(packet data unit)~~ or a self-contained packet has been transmitted.

12. (Amended) A digital cellular mobile radio system ~~consisting~~ having ~~of~~ a network and mobile stations, comprising: a device to ~~for~~ switching a communications link to another channel (handover) which uses a decision algorithm with respect to a ~~the~~ time of handover, the handover ~~only taking place~~ occurring after a complete voice or data frame has been transmitted.

Please add the following claim:

13. The method as claimed in claim 1, wherein the frames are voice or data frames.

In the Abstract:

Please replace the Abstract in its entirety with the Abstract attached hereto.

METHOD FOR SWITCHING A COMMUNICATIONS LINK TO ANOTHER CHANNEL (HANDOVER)

Abstract

The invention relates to a method for switching a communications link to another channel (handover) in digital cellular mobile radio systems and a mobile radio system, the time of the handover being determined by a decision algorithm. Roughly generalized, the changeover to a new channel can take place between two radio systems or frequency bands within a radio system (external handover), between two radio cells within a cellular network (intercell handover) or within a radio cell (intracell handover). Each handover case, in turn, can include various type of handover.

Docket No. 449122008200

3/PRTS

09/889179

JC13 Rec'd PCT/PTO 12 JUL 2001

Description

Method for switching a communications link to another channel (handover)

The invention relates to a method for switching a communications link to another channel (handover) in digital cellular mobile radio systems and a mobile radio system, the time of the handover being determined by a decision algorithm. Roughly generalized, the changeover to a new channel can take place between two radio systems or frequency bands within a radio system (external handover), between two radio cells within a cellular network (intercell handover) or within a radio cell (intracell handover). Each handover case, in turn, can include various type of handover.

The beginning of mobile telecommunication was dominated by a multiplicity of different incompatible systems and mobile radio networks which in most cases were set up along national and proprietary lines. Out of this situation, the definition of pan-European standards was begun during the changeover to the fully digital transmission of voice and signaling, among which standards DECT (Digital European Cordless Telephone), on the one hand, and GSM (Global System for Mobile Communications) and UMTS (Universal Mobile Telecommunication Service), on the other hand, will be compared in greater detail in the text below.

In principle, in the systems mentioned, the data to be transmitted are split into units, so-called voice or data frames, which are transmitted in succession. The size of these frames, and thus the quantity of data contained in them, and the treatment of the data within the frames for the purpose of increasing the data throughput and the data security (e.g. interleaving) are defined in the individual standards.

The DECT standard is used for supporting personal quasi-static communication services and is called cordless ISDN because of its characteristics. Due to a seamless handover, DECT is particularly well suited to dense traffic. The seamless handover in the DECT system is essentially based on the fact that a 32-kbit/s ADPCM (Adaptive Delta Pulse Code Modulation) speech codec is used which continuously supplies data. The speech frames in the ADPCM speech codec correspond to speech having the duration of one sample. At a sampling rate of, for example, 8 kHz, one frame thus corresponds to a period of 125 μs. Furthermore, the coded speech frames are not transmitted interleaved over a number of time slots.

GSM is the first digital cellular mobile radio standard which, with international roaming and ISDN capability, offers international mobility, a high data security and a great variety of data. Continuing on from this, the existing standards lead to the pan-European universal mobile radio standard UMTS. In the future UMTS standard, two modes are proposed, which are FDD (Frequency Division Duplex) and TDD (Time Division Duplex). In the FDD mode, a transmission channel is characterized by the degrees of freedom of frequency and spread-spectrum code. This is a CDMA (Code Division Multiple Access) system. The principle of CDMA consists in distinguishing between mobile radio subscribers not only by means of different frequencies but also sequences of codes. In the TDD mode, a transmission channel is defined by the degrees of freedom, frequency, time slot and spread-spectrum code. The UMTS TDD mode is called a TD/CDMA system.

In the GSM standard or in the UMTS system, too, speech codecs are used which in each case process voice or data frames having a fixed length of 20 ms. In the GSM standard or also in the TDD mode

of the UMTS system, these frames are transmitted by means of the TDMA (Time Division Multiple Access) method in which the voice and data frames are transmitted distributed over a number of time slots which are produced by dividing a carrier frequency over a number of mobile stations. With a time slot period of 10 ms in the TDD mode, a voice or data frame is transmitted in two successive TDMA frames. In TDD mode, 16 time slots are provided in one TDMA frame. To be able to correct, on the one hand, random bit errors and, on the other hand, burst errors of the mobile radio channel, redundancies are added to the data to be transmitted for protecting against errors. In addition, the data are transmitted interleaved in two blocks in order to achieve further improvement with respect to disturbances such as, for example, fading. When there is interleaving, the data are not forwarded in the same order but a new temporal sorting is created which, naturally, is cancelled again at the receiving end.

In the FDD mode (CDMA), too, the data are transmitted in interleaved blocks.

The cellular structure of the entire coverage area demands that a seamless handover of a mobile station from the previous coverage area to another coverage area is established if the latter promises better transmission quality. The handover is a very critical process with respect to timing since the continuity of current calls must be ensured. It has a significant influence on the capacity and the performance of cellular networks and consists of the following three phases: measurement, handover initiation, switchover to the destination base station. The continuous measurements have the purpose of detecting whether a handover is necessary. A handover algorithm makes the decision whether and when a change of transmission channel is required or appropriate

dependent on various criteria such as received power, bit error rates, signal/noise ratios and distance from the current base station.

Once the handover algorithm has made a handover decision, the necessary preparations are made in the network and, in particular, the landline connection from the mobile switching center to the new base station is switched through and a new suitable transmission channel is selected. Further actions with respect to subscriber and mobility administration can be added before the final handover takes place in a third phase without regard to the interleaving of the transmission data. It is thus possible that the complete voice frame has not been received on the old transmission channel and only part of the first voice frame is received on the new transmission channel, for example only the second block of the voice frame in the UMTS TDD mode. In the worst case, a bit error rate of at least 50% arises for both voice frames due to the interleaving, with the result that repair becomes impossible even by inserted redundancies. Two successive voice frames are thus unusable, as a result of which the quality of the voice link drops since at least 40 ms of speech are missing. This loss is clearly noticeable.

The same problems occur during the transmission of packet data in packet mode or during the transmission of data with large interleaving depths. If a self-contained data packet is not completely transmitted due to a handover, important information of a larger file, which is contained in it, is lost.

The invention is based on the object of reducing the disturbances described, increased by the interleaving of the data, during handover.

The object is achieved by methods having the feature of the independent claims 1 and 11 and by a mobile radio system having the features of claim 12. Advantageous further developments of the invention are specified in the dependent claims 2 to 10.

According to this, a handover according to the invention is only performed after the transmission of a complete voice or data frame, taking into consideration the interleaving depth, as a result of which the data losses in the currently used handover methods as described above are reliably prevented. Handover is understood to be not only the intracell handover or the handover between two cells of a cellular network but also the handover from one system to another system such as, for example, from UMTS TDD to UMTS FDD or to GSM or internally in the case of a handover from one frequency to another frequency.

The time of the handover is lastly determined by a device which is implemented in the network and/or in the mobile station. It is additionally determined on the basis of the knowledge of the interleaving of the transmission data.

In the case of data transmissions (voice, fax, modem) in TDMA systems, handover only takes place after transmission of a TDMA frame having a TDMA frame number that meets the condition:
(TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

In the case of voice links, this means that the first block of the voice frame is transmitted in an odd-numbered TDMA frame and the second block of the voice frame is transmitted in an even-numbered TDMA frame and the handover is thus performed exclusively after an even-numbered TDMA frame has been transmitted.

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In the case of a transmission of a voice frame over n (n = integral, even-numbered) time slots, however, the first data block of the voice frame can also be transmitted in an even-numbered TDMA frame and the second data block of the voice frame can be transmitted in an odd-numbered TDMA frame and the handover can thus be performed exclusively after an odd-numbered TDMA frame has been transmitted.

The interleaving depth to be taken into consideration for a handover can be marked by flags in an advantageous further development, where a separate flag can be allocated, for example, to each service (voice service, data services). The mobile station receives this information via the control channel for transmitting general data (CCH(D_m), and especially via the logical broadcast control channel (BCCH), a common control channel (CCCH) associated with a traffic channel (TCH) or by inband signaling in the dedicated control channel (DCCH).

In an analogous application, the method can also be applied to the transmission of packet data by performing a handover only when a packet data unit (PDU) or a self-contained packet has been completely transmitted.

The invention and its advantages will be explained in greater detail with reference to an exemplary embodiment, associated with a drawing, in which:

Figure 1 shows a reference model of voice transmission in digital mobile radio,

Figure 2 shows a section according to the reference model of figure 1, containing exemplary values of a transmission during a handover in accordance with the prior art, and

Figure 3 shows a section according to the reference model of figure 1 with exemplary values of a transmission in the case of a handover according to the invention.

The diagrammatic reference model for voice transmission in a digital mobile radio network, shown in figure 1, shows the individual processing steps from the voice input to the reproduction. Initially, voice 1 is digitized at 2, channel coding takes place at 3, interleaving takes place at 4, burst formatting takes place at 5, encryption takes place at 6 and at 7 the binary data are modulated onto the carrier signal. After the data have been transmitted to a receiver via a radio interface, demodulation takes place at 8, the data are decrypted at 9, the burst information from 5 is analyzed at 10, the interleaved data are sorted into the correct output order at 11, channel decoding takes place at 12 and, finally, at 13 the digital signals are converted into the transmitted voice information 14.

Figure 2 shows by way of example a voice frame 15 as provided after the channel coding at 3. The voice frame 15 is split into two TDMA frames 17 by means of an interleaving matrix 16 which is formed by writing the voice frame 15 in row by row, in such a manner that any bit errors are distributed, thus increasing the possibility of error repair. Assuming handover takes place after the first TDMA frame has been transmitted from 17 so that the second TDMA frame is missing, data losses are produced during the reconstruction of the interleaving matrix at the receiver end 18 from the point at which handover took place and these data losses cannot be repaired in the received data frame 19. This data frame is thus unusable and the information contained in it is lost. Naturally, this also applies to the case where only the second TDMA frame is transmitted.

According to figure 3, handover always takes place after the entire voice frame has been transmitted, thus after both

ersatzblatt (regel 26)

TDMA frames 17 have been transmitted, in the example, so that the data losses shown in figure 2 can no longer occur and the received voice frame 18 contains the data in full. Since voice frames always have a particular length and thus there is always a net data rate of 160 bits, for example, in the case of 8-kbit/s voice and a period of 20 ms, the end of a voice frame can be easily counted off.

This equally applies to the end of complete data packets or data segments which are always transmitted in a particular size, e.g. 800 bits in the case of data packets. The size itself, however, can vary depending on the data rate of the packet data service.

The invention can also be used to good effect in the FDD mode of the CDMA system in which the data are also transmitted in interleaved blocks. A handover is appropriately performed only after a complete voice or data frame has been received, and not within a voice or data frame.

Ersatzblatt (Regel 26)

Patent Claims

1. A method for switching a communications link to another channel (handover) within or between digital cellular mobile radio systems consisting of a network and mobile stations in which the data to be transmitted are split into so-called voice or data frames of identical length and are interleaved and where the time of handover is determined by a decision algorithm, characterized in that the handover only takes place after a complete voice or data frame has been transmitted.

2. The method as claimed in claim 1, characterized in that the handover is carried out taking into consideration the interleaving depth.

3. The method as claimed in claim 1, characterized in that the time of handover is determined by the network on the basis of the knowledge of the interleaving of the transmission data.

4. The method as claimed in claim 1, characterized in that the time of handover is determined by the mobile station on the basis of the knowledge of the interleaving of the transmission data.

5. The method as claimed in claim 1, characterized in that in the case of data transmissions (voice, fax, modem, multimedia) in TDMA systems, handover only takes place after transmission of a TDMA frame with a TDMA frame number that meets the condition:

ersatzblatt (regel 26)

(TDMA frame number - starting TDMA frame number + 1) modulo interleaving depth = 0.

6. The method as claimed in claim 1, characterized in that in the case of voice links, the first data block of the voice frame is transmitted in an odd-numbered TDMA frame and the second data block of the voice frame is transmitted in an even-numbered TDMA frame and the handover is thus performed exclusively after an even-numbered TDMA frame has been transmitted.

7. The method as claimed in claim 1, characterized in that in the case of a transmission of a voice or data frame over n (n = integral, even-numbered) time slots, the first block of the voice frame is transmitted in an even-numbered TDMA frame and the second block of the voice or data frame is transmitted in an odd-numbered TDMA frame and the handover is thus performed exclusively after an odd-numbered TDMA frame has been transmitted.

8. The method as claimed in claim 2, characterized in that a flag marks the interleaving depth to be taken into consideration in the handover.

9. The method as claimed in claim 8, characterized in that a flag specifying the interleaving depth to be taken into consideration is set for each service (voice service, data service).

10. The method as claimed in claim 1, characterized in that in the case of data transmissions in CDMA systems, the handover only takes place after a complete voice or data frame has been transmitted.

11. A method for switching a communications link to another channel (handover) within or between digital cellular mobile radio systems with packet access consisting of a network and mobile stations, the time of handover being determined by a decision algorithm, characterized in that the handover only takes place after a complete segment (packet data unit) or a self-contained packet has been transmitted.

12. A digital cellular mobile radio system consisting of a network and mobile stations, comprising a device for switching a communications link to another channel (handover) which uses a decision algorithm with respect to the time of handover, the handover only taking place after a complete voice or data frame has been transmitted.

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Patent Claims

1. A method for switching a communications link to another channel (handover) within or between digital cellular mobile radio systems consisting of a network and mobile stations, in which the data of voice or data frames to be transmitted are split into blocks of equal length and are interleaved, and where the time of handover is determined by a decision algorithm, characterized in that the handover only takes place after a complete voice or data frame has been transmitted.

2. The method as claimed in claim 1, characterized in that the handover is carried out taking into consideration the interleaving depth.

3. The method as claimed in claim 1, characterized in that the time of handover is determined by the network on the basis of the knowledge of the interleaving of the transmission data.

4. The method as claimed in claim 1, characterized in that the time of handover is determined by the mobile station on the basis of the knowledge of the interleaving of the transmission data.

5. The method as claimed in claim 1, characterized in that in the case of data transmissions (voice, fax, modem, multimedia) in TDMA systems, handover only takes place after transmission of a TDMA frame with a TDMA frame number that meets the condition:

11. Digital cellular mobile radio system consisting of a network and mobile stations, comprising a device for switching a communications link to another channel (handover) which uses a decision algorithm with respect to the time of handover, the handover only taking place after a complete voice or data frame has been transmitted and where the data of voice or data frames to be transmitted are split into blocks of equal length and are interleaved.

09/926704
PCT/DE00/00063

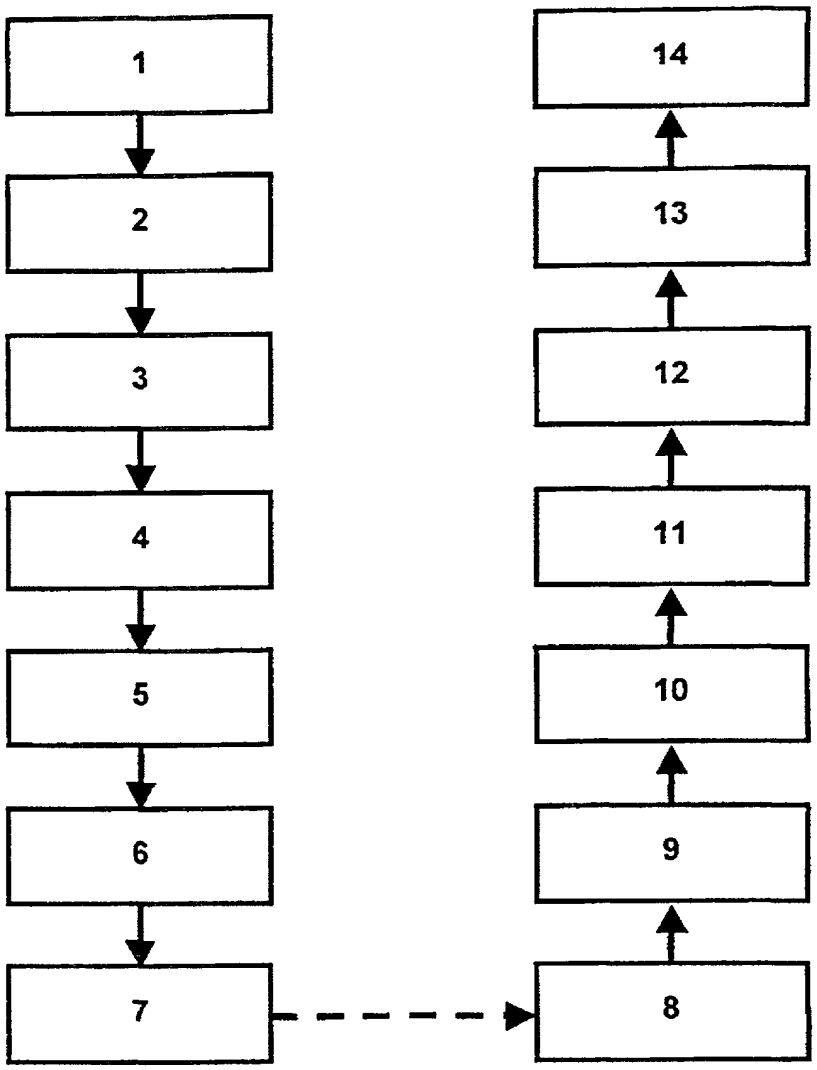

Fig. 1

10/889179
DT05 Rec'd PCT/PTO 26 JUL 2001

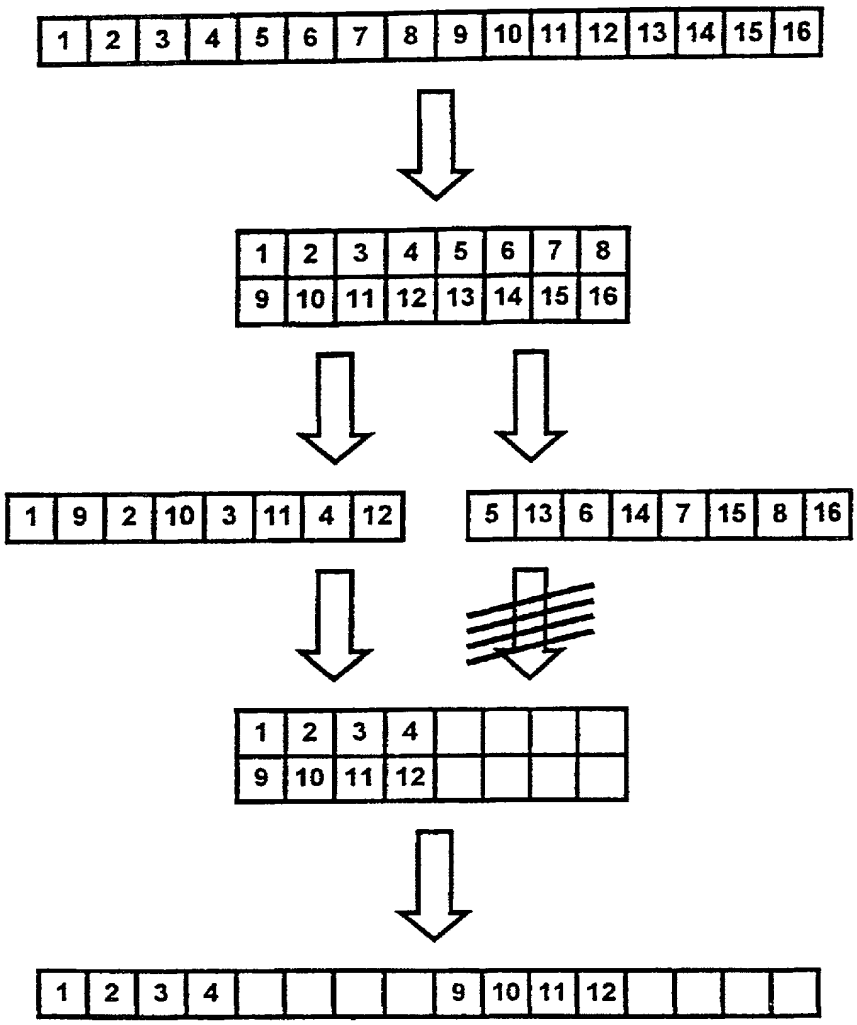

Fig. 2 (Prior Art)

FORM 3614 (8-83) 0868

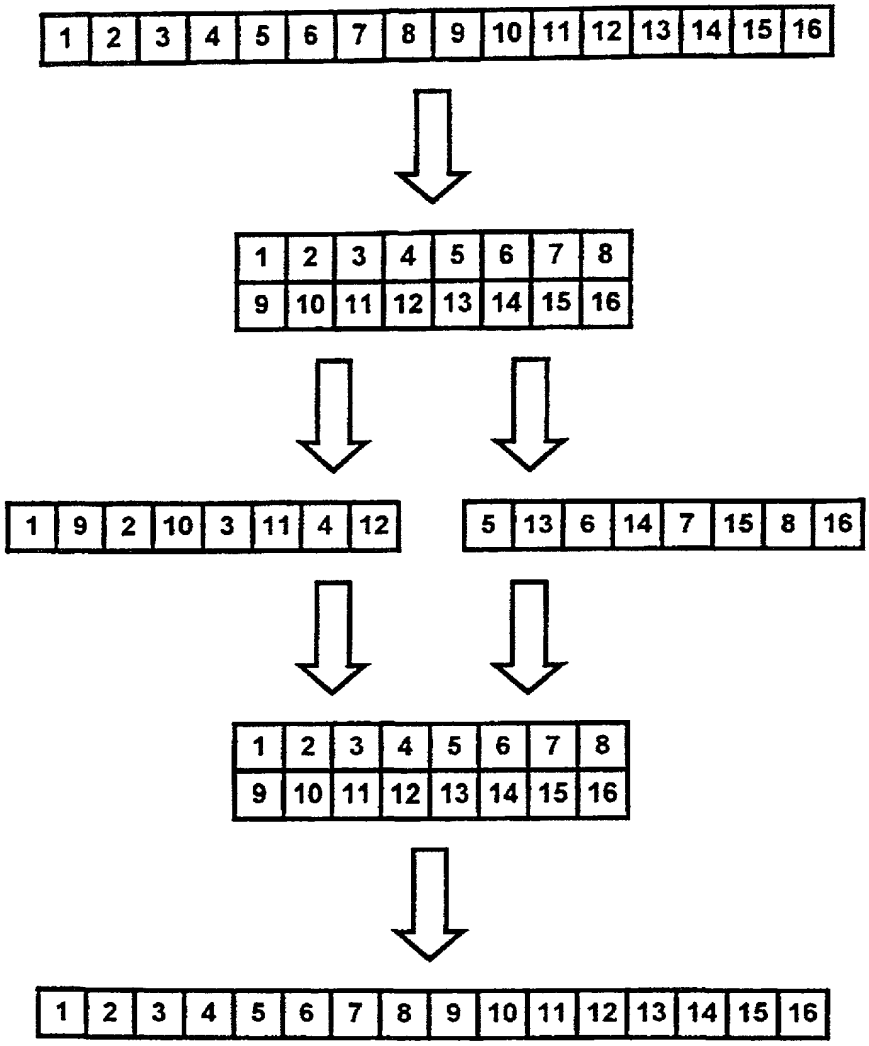
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
1 9 2 10 3 11 4 12
5 13 6 14 7 15 8 16
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Fig. 3

U.S NATIONAL STAGE WORKSHEET (DO/EO)

U.S. APPL. NO. 09/890179 INTERNATIONAL APPL. DE00-000163

APPLICATION FILED BY: 20 MOS., ____ OR 30 MOS., ✓ SCREENED BY 1813

INTERNATIONAL APPLICATION PAPERS IN THE APPLICATION FILE:

- ✓ International application
- ___ Article 19 amendments
- ✓ Priority Document(s) No. (1)
- ___ Request Form PCT/RO/101
- ___ PCT/IB/302
- ___ PCT/IB/304
- ___ PCT/IB/306
- ___ PCT/IB/308
- ✓ PCT/IB/331
- ___ OTHER PCT/IB/_____
- ✓ PCT/IPEA/409 also 416
- ___ 409 annexes to IPER
- ✓ PCT/ISA/210 (Search report)
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35 USC Receipt of Request (PTO – 1399 Transmittal Letter) 12 July 01
Date Acceptable oath/declaration received 12 July 01
102(e) Date 12 July 01
Date complete 35 USC 371 requirements met _____

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(1813)

DO/EO 903 Notice of Acceptance _____
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DO/EO 913 Notice of defective translation _____
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German Language Declaration

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Staatsangehörigkeit: DE	Citizenship: DE
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Unterschrift des Erfinders / Datum: 3/7/01	Second Inventor's signature / Date
Wohnsitz: MUENCHEN, DEUTSCHLAND	Residence: MUENCHEN, GERMANY
Staatsangehörigkeit: DE	Citizenship: DE
Postanschrift: WITTENBERGER STR. 3, 80993 MUENCHEN	Post Office Address: WITTENBERGER STR. 3, 80993 MUENCHEN

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Verfahren zum Umschalten einer Kommunikationsverbindung auf einen anderen Kanal (Handover)

deren Beschreibung

(zutreffendes ankreuzen)
☐ hier beigefügt ist.
☒ am 10.01.2000 als
PCT internationale Anmeldung
PCT Anmeldungsnummer PCT/DE00/00063
eingereicht wurde und am _____
abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Method for switching a communications link to another channel (handover)

the specification of which

(check one)
☐ is attached hereto.
☒ was filed on 10.01.2000 as
PCT international application
PCT Application No. PCT/DE00/00063
and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

IDNR: 2590 / V: 99-1.00 / B:Val

German Language Declaration

Prior foreign appplications
Priorität beansprucht

			Priority Claimed
19901004.8 (Number) (Nummer)	DE (Country) (Land)	13.01.1999 (Day Month Year Filed) (Tag Monat Jahr eingereicht)	☒ Yes Ja ☐ No Nein
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	☐ Yes Ja ☐ No Nein
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	☐ Yes Ja ☐ No Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35. United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/00063 (Application Serial No.) (Anmeldeseriennummer)	10.01.2000 (Filing Date D, M, Y) (Anmeldedatum T, M, J)	anhängig (Status) (patentiert, anhängig, aufgegeben)	pending (Status) (patented, pending, abandoned)
_____ (Application Serial No.) (Anmeldeseriennummer)	(Filing Date D,M,Y) (Anmeldedatum T, M; J)	_____ (Status) (patentiert, anhängig, aufgeben)	(Status) (patented, pending, abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.